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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,142	12/31/2003	Anthony DiCarlo	TI-36187	7928
23494	7590	08/18/2005	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			VINH, LAN	
			ART UNIT	PAPER NUMBER
			1765	
DATE MAILED: 08/18/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/750,142

**Applicant(s)**

DICARLO ET AL.

**Examiner**

Lan Vinh

**Art Unit**

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15-18 is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>070204</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 15 is objected to because of the following informalities: in line 19 of claim 15, "aching" appears to be a typographical error, the examiner suggests replacing "aching" with --ashing--. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 recites the limitation "the material". There is insufficient antecedent basis for this limitation in the claim.

Claims 9-14 are indefinite because they depend on claim 8

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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4. Claims 1, 4-5, 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee (US 6,296,988)

Lee discloses a method for forming a metal wiring pattern includes the step of removing pattern resist that remains after an etch of an underlying metal pattern. The method comprises the steps of:

- cleaning a semiconductor substrate/wafer with a chemical wet cleaning/develop solution (col 2, lines 65-67)

- ashing the surface of the substrate (col 2, lines 49-51)

- removing the remaining photoresist pattern after the cleaning and ashing step (col 3, lines 3-5)

Regarding claims 4-5, Lee discloses substantially removing the polymer residue from the photoresist pattern 50 (col 2, lines 65-67; fig. 2E) and the polymer residue/hardened skin from the pattern is removed by the ashing step (fig. 2E)

Regarding claim 7, Lee discloses forming a wiring metal pattern (col 2, lines 28-30)

5. Claims 8, 11-12, 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee (US 6,296,988)

Lee discloses a method for forming a metal wiring pattern includes the step of removing pattern resist that remains after an etch of an underlying metal pattern. The method comprises the steps of:

- depositing a layer 20/spacer layer (col 2, lines 26-27)

- depositing a metal layer 30/material for the patterned layer (col 2, lines 29-30)

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depositing a pattern resist layer 50 (col 2, lines 30-31)

patterning the metal layer 30 (col 2, lines 35-38)

etching the resist layer and the metal layer (col 2, lines 38-40)

cleaning a semiconductor substrate/wafer with a chemical wet cleaning/develop solution (col 2, lines 65-67)

ashing the surface of the substrate (col 2, lines 49-51)

removing the remaining photoresist pattern after the cleaning and ashing step (col 3, lines 3-5)

Regarding claims 11-12, Lee discloses substantially removing the polymer residue from the photoresist pattern 50 (col 2, lines 65-67; fig. 2E) and the polymer residue/hardened skin from the pattern is removed by the ashing step (fig. 2E)

Regarding claim 14, Lee discloses forming a wiring metal pattern (col 2, lines 28-30)

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3-4, 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US 6,296,988) in view of Chinn et al (US 2004/0053505A1)

Lee method has been described above. Unlike the instant claimed inventions as per claims 3-4, 9-10, Lee fails to specifically disclose that the wafer/semiconductor substrate is a micromechanical device/DMD wafer

Chinn, in a method for etching features, discloses that an etched silicon feature can be used in various MEMS/micromechanical devices (see abstract)

Hence, one skilled in the art at the time the invention was made would have found it obvious to employ Lee etched structure as a micromechanical device in view of Chinn teaching because Chinn discloses that silicon structure can be used in a variety of MEMS applications, including MEMS in semiconductor device applications (col 6, paragraph 0066)

8. Claims 6, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US 6,296,988) in view of Nguyen et al (US 6,472,315)

Lee method has been described above. Unlike the instant claimed inventions as per claims 6, 13, Lee fails to specifically disclose performing the removing step with an acetate strip process

Nguyen discloses a method for fabricating an interconnect system comprises the step of removing a patterned photoresist with an acetate solution (col 5, lines 30-35)

Hence, one skilled in the art at the time the invention was made would have found it obvious to modify Lee method by performing the step of removing the photoresist with an acetate solution as per Nguyen because Nguyen discloses that the photoresist is essentially dissolved in a solution that includes ethylene acetate (col 5, lines 33-38)

***Allowable Subject Matter***

9. Claims 15-18 allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claim 15, the cited prior art of record fails to disclose or suggest a method of forming a micromirror array comprises the step of "removing pattern ...aching steps", in combination with the rest of the limitations of claim 15

***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471.

The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.



LV  
August 16, 2005